UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/830,211	04/21/2004	Fei Ge	50277-2433	9360

42425 7590 09/19/2007

HICKMAN PALERMO TRUONG & BECKER/ORACLE
2055 GATEWAY PLACE
SUITE 550
SAN JOSE, CA 95110-1089

EXAMINER	
MORRISON, JAY A	

ART UNIT	PAPER NUMBER
2168	

MAIL DATE	DELIVERY MODE
09/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

mn

Office Action Summary	Application No.	Applicant(s)	
	10/830,211	GE ET AL.	
	Examiner	Art Unit	
	Jay A. Morrison	2168	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 August 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/13/07 has been entered.

Remarks

2. Claims 1-50 are pending.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 38-41 and 47 are rejected under 35 U.S.C. 102(b) as being anticipated by Bohannon et al. ('Bohannon' hereinafter) ("From XML Schema to Relations: A Cost-Based Approach to XML Storage", IEEE ICDE, 2002.).

As per claim 38, Bohannon teaches

A method comprising the computer-implemented steps of: (see abstract)

gathering, by a database management system, statistics about how many nodes within one or more XML resources that are stored in a repository of said database management system satisfy certain criteria; storing said statistics in said database management system; (useful statistics about the data stored, 8, section 3.1, last paragraph)

and the database management system using the statistics to determine how to process a query that accesses the one or more XML resources. (statistics used by optimizer, section 4.2, third paragraph)

As per claim 39, Bohannon teaches

the step of storing comprises storing said statistics as an XML data type in a schema-based table in said database management system. (stored, section 3.1, last paragraph)

As per claim 40, Bohannon teaches

said one or more XML resources are logically organized as a hierarchy of nodes in which each node is either a container or a resource, and wherein the step of gathering statistics comprises gathering each of a total number of nodes, in one or more hierarchies associated with said one or more XML resources, that are accessible via a

path through a specified node, a total number of containers, in one or more hierarchies associated with said one or more XML resources, that are accessible via a path through a specified node, a total number of nodes, in one or more hierarchies associated with said one or more said XML resources, that are accessible via a path through a specified node and that are in a level of said one or more hierarchies that is immediately under a level of said specified node, a total number of containers, in one or more hierarchies associated with said one or more XML resources, that are accessible via a path through a specified node and that are in a level of said one or more hierarchies that is immediately under a level of said specified node. (useful statistics about the data stored, section 3.1, last paragraph)

As per claim 41,

This claim is rejected on grounds corresponding to the arguments given above for rejected claim 38 and is similarly rejected.

As per claim 47, Bohannon teaches

A database system comprising: (see abstract)

an XML data repository within a relational database management system; (abstract)

and a query optimizer that is configured to receive a database query and, in response to said query, formulate a query execution plan based on computational costs

of access paths associated with XML data stored in said repository, (statistics used by optimizer to compute costs of query, section 4.2, third paragraph)

wherein said computational costs are based on statistics characterizing an organizational structure of said XML data. (statistics of underlying XML data, section 1, first bullet point)

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-37, 42-46 and 48-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohannon et al. ('Bohannon' hereinafter) ("From XML Schema to Relations: A Cost-Based Approach to XML Storage", IEEE ICDE, 2002.) in view of Bossman et al. ('Bossman' hereinafter) (Patent Number 7,139,749).

As per claim 1, Bohannon teaches

A method comprising the computer-implemented steps of: (see abstract)

gathering statistics by a database server about XML resources that are stored in a database repository that is managed by the database server; storing said statistics; (useful statistics about the data stored, section 3.1, last paragraph)

and in response to a request to the database server for access to one or more XML resources from said database repository, (query in SQL workload, section 4.2, third paragraph)

said one or more XML resources from said database repository, based on said statistics. (statistics used by optimizer, section 4.2, third paragraph)

Bohannon does not explicitly indicate "the database server computing a computational cost associated with each of two or more methods of accessing".

However, Bossman discloses "the database server computing a computational cost associated with each of two or more methods of accessing" (choose the access path with least expensive computed cost, column 8, lines 30-35).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Bohannon and Bossman because using the steps of

"the database server computing a computational cost associated with each of two or more methods of accessing" would have given those skilled in the art the tools to improve the invention by having an automated way to select the optimal path. This gives the user the advantage of not having to spend the time and use human resources for such tuning.

As per claim 2, Bohannon teaches

each of said XML resources is logically organized in a hierarchy of nodes in which each node is either a container or a resource, (XML data, section 1, first paragraph)

and wherein the step of gathering statistics comprises gathering one or more data from a group consisting of a total number of nodes, in one or more hierarchies associated with one or more of said XML resources, that are accessible via a path through a specified node, a total number of containers, in one or more hierarchies associated with one or more of said XML resources, that are accessible via a path through a specified node, a total number of nodes, in one or more hierarchies associated with one or more of said XML resources, that are accessible via a path through a specified node and that are in a level of said one or more hierarchies that is immediately under a level of said specified node, a total number of containers, in one or more hierarchies associated with one or more of said XML resources, that are accessible via a path through a specified node and that are in a level of said one or more hierarchies that is immediately under a level of said specified node, and a number

of levels, from a root node of one of one or more hierarchies associated with one or more of said XML resources, at which a specified node is organized in said one of one or more hierarchies. (statistics about underlying data, section 1, first bullet point; useful statistics about the data stored, section 3.1, last paragraph)

As per claim 3, Bohannon teaches

each of said XML resources is logically organized in a hierarchy of nodes in which each node is either a container or a resource, (XML data, section 1, first paragraph)

and wherein the step of gathering statistics comprises gathering each of a total number of nodes, in one or more hierarchies associated with one or more of said XML resources, that are accessible via a path through a specified node, a total number of containers, in one or more hierarchies associated with one or more of said XML resources, that are accessible via a path through a specified node, a total number of nodes, in one or more hierarchies associated with one or more of said XML resources, that are accessible via a path through a specified node and that are in a level of said one or more hierarchies that is immediately under a level of said specified node, a total number of containers, in one or more hierarchies associated with one or more of said XML resources, that are accessible via a path through a specified node and that are in a level of said one or more hierarchies that is immediately under a level of said specified node, and a number of levels, from a root node of one of one or more hierarchies associated with one or more of said XML resources, at which a specified node is

organized in said one of one or more hierarchies. (statistics about underlying data, section 1, first bullet point; useful statistics about the data stored, section 3.1, last paragraph)

As per claim 4, Bohannon teaches

the step of storing statistics comprises storing said statistics in a relational table of a database of which said database repository is part. (statistics about underlying data, mapped to relational schema, section 1, first bullet point)

As per claim 5, Bohannon teaches

said relational table is a first relational table that is a different table than a second relational table in which said XML resources are stored in said database repository. (statistics about underlying data, mapped to relational schema, section 1, first bullet point)

As per claim 6, Bohannon teaches

said relational table is a relational table in which said XML resources are stored in said database repository. (mapped to relational schema, section 1, first bullet point)

As per claim 7, Bohannon teaches

the step of storing statistics comprises storing said statistics in a hierarchical index table in which said XML resources are indexed to said database repository. (section 5.3, fourth paragraph)

As per claim 8, Bohannon teaches

the step of computing a computational cost comprises computing a selectivity value for each of one or more predicates, from said request, that contain operators on said database repository. (section 4.2, fourth paragraph)

As per claim 9, Bohannon teaches

each of said XML resources is logically organized in a hierarchy of nodes and stored, in association with a location of one or more of said XML resources, in a column of a table in said database repository, and wherein an operator contained in at least one of said one or more predicates is an operator that determines whether a particular XML resource can be located in said database repository through a particular specified path through a portion of one or more hierarchies associated with one or more of said XML resources. (section 1, first bullet point)

As per claim 10, Bohannon teaches

each of said XML resources is logically organized in a hierarchy of nodes and stored, in association with a location of one or more of said XML resources, in a column of a table in said database repository, and wherein an operator contained in at least one

of said one or more predicates is an operator that determines whether a particular XML resource can be located in said database repository at a terminal location of a particular specified path through a portion of one or more hierarchies associated with one or more of said XML resources. (section 1, first bullet point)

As per claim 11, Bohannon teaches

the step of computing a computational cost comprises computing a computational cost of traversing, to locate a particular XML resource specified in said request, an index in which said XML resources are indexed to said database repository. (section 4.2, third paragraph)

As per claim 12, Bohannon teaches

computing said computational cost of traversing an index comprises computing a computational cost associated with one or more CPUs used for said traversing. (section 4.2, third paragraph)

As per claim 13, Bohannon teaches

computing said computational cost of traversing an index comprises computing a computational cost associated with reading data blocks in which portions of said index are stored. (section 5.3, fourth paragraph)

As per claim 14, Bohannon teaches

computing said computational cost of traversing an index comprises computing (a) a computational cost associated with one or more CPUs used for said traversing and (b) a computational cost associated with reading data blocks in which portions of said index are stored. (section 4.2, third paragraph)

As per claim 15, Bohannon teaches

the step of computing a computational cost comprises (a) computing a selectivity value for each of one or more predicates, from said request, that contain operators on said database repository and (b) computing a computational cost of traversing, to locate a particular XML resource specified in said request, an index in which said XML resources are indexed to said database repository. (section 5.3, fourth paragraph)

As per claim 16, Bohannon teaches

said request for access to one or more XML resources from said database repository is a SQL query. (query in SQL workload, section 4.2, third paragraph)

As per claim 17, Bohannon teaches

each of said XML resources is logically organized in a hierarchy of nodes and stored, in association with a location of one or more of said XML resources, in a column of a table in said database repository, and wherein said SQL query comprises a mechanism for providing at least one possible path through one or more hierarchies

associated with one or more of said XML resources to each node of said XML resources. (section 1, first bullet point)

As per claim 18, Bohannon teaches

the step of computing a computational cost comprises computing a computational cost component for one or more predicates, from said request, that contain an operator in conjunction with said mechanism acting on said database repository. (section 4.2, third paragraph)

As per claim 19, Bohannon teaches

each of said XML resources is logically organized in a hierarchy of nodes and stored, in association with a location of one or more of said XML resources, in a column of a table in said database repository, and wherein said SQL query comprises a mechanism for providing all possible paths through one or more hierarchies associated with one or more of said XML resources to each node of said XML resources. (useful statistics about the data stored, section 3.1, last paragraph)

As per claim 20, Bohannon teaches

the step of computing a computational cost comprises computing a computational cost component for one or more predicates, from said request, that contain an operator in conjunction with said mechanism acting on said database repository. (section 4.2, third paragraph)

As per claim 21, Bohannon teaches

said database repository is part of a relational database management system. (abstract)

As per claims 22-37,

These claims are rejected on grounds corresponding to the arguments given above for rejected claims 1-16 and are similarly rejected.

As per claim 42, Bohannon teaches

A method comprising the computer-implemented steps of: (see abstract)

in response to a request for access to one or more XML resources from a database repository within a database management system, (query in SQL workload, section 4.2, third paragraph)

accessing, from said database management system, statistics about a structure of a hierarchy associated with said one or more XML resources; (statistics about underlying data, section 1, first bullet point; useful statistics about the data stored, section 3.1, last paragraph)

said one or more XML resources from said database repository, based on said statistics. (statistics used by optimizer, section 4.2, third paragraph)

Bohannon does not explicitly indicate "and computing a computational cost associated with each of two or more methods of accessing".

However, Bossman discloses "and computing a computational cost associated with each of two or more methods of accessing" (choose the access path with least expensive computed cost, column 8, lines 30-35).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Bohannon and Bossman because using the steps of "and computing a computational cost associated with each of two or more methods of accessing" would have given those skilled in the art the tools to improve the invention by having an automated way to select the optimal path. This gives the user the advantage of not having to spend the time and use human resources for such tuning.

As per claim 43, Bohannon teaches

the step of computing a computational cost comprises computing a selectivity value for each of one or more predicates, from said request, that contain operators on said database repository. (section 6, fifth paragraph)

As per claim 44, Bohannon teaches

the step of computing a computational cost comprises computing a computational cost of traversing, to locate particular XML resources specified in said request, an index in which said XML resources are indexed to said database repository. (section 5.3, fourth paragraph)

As per claim 45, Bohannon teaches

the step of computing a computational cost comprises (a) computing a selectivity value for each of one or more predicates, from said request, that contain operators on said database repository and (b) computing a computational cost of traversing, to locate a particular XML resource specified in said request, an index in which said XML resources are indexed to said database repository. (section 5.2, third paragraph)

As per claim 46,

This claim is rejected on grounds corresponding to the arguments given above for rejected claim 42 and is similarly rejected.

As per claim 48,

This claim is rejected on grounds corresponding to the arguments given above for rejected claim 1 and is similarly rejected.

As per claim 49, Bohannon teaches

each of said XML resources is logically organized in a hierarchy of nodes, and wherein the step of gathering statistics comprises gathering statistics about a median depth of a plurality of paths to a plurality of nodes in one or more hierarchies associated with one or more of said XML resources, and wherein the plurality of nodes are accessible via a path through a specified node. (useful statistics about the data stored, section 3.1, last paragraph)

As per claim 50, Bohannon teaches

each of said XML resources is logically organized in a hierarchy of nodes, and wherein the step of gathering statistics comprises gathering statistics about a maximum depth of a plurality of paths to a plurality of nodes in one or more hierarchies associated with one or more of said XML resources, and wherein the plurality of nodes are accessible via a path through a specified node. (useful statistics about the data stored, section 3.1, last paragraph)

Response to Arguments

7. Applicant's arguments with respect to claims 1-50 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. The prior art made of record, listed on form PTO-892, and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jay A. Morrison whose telephone number is (571) 272-7112. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Vo can be reached on (571) 272-3642. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TIM VO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

Jay Morrison
TC2100

Tim Vo
TC2100